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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Deborah T. Marr

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EXAMINER

TSAI, HENRY

ART UNIT

PAPER NUMBER

2181

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/728,962

Applicant(s)

MARR ET AL.

Examiner

Henry W.H. Tsai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/16/06.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/16/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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**DETAILED ACTION**

***Terminal Disclaimer***

1. The terminal disclaimer filed on 2/16/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,671,795 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 21-28 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims to computer-related inventions that are clearly nonstatutory fall into the same general categories as nonstatutory claims in other arts, namely natural phenomena such as magnetism, and abstract ideas or laws of nature which constitute "descriptive material." Abstract ideas, Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759, or the mere manipulation of abstract ideas, Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58, are not patentable. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context,

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"functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data (See MPEP section 2106, IV, B, 1).

Claim 21 comprises steps of determining, pausing, and resuming. The steps are just an abstract idea. The claim do not provide practical application that produces a useful, tangible and concrete result. Therefore, the claim is non-statutory. Similar problems exist in the other claims 22-25 since the additional limitations claimed therein do not provide practical application that produces a useful, tangible and concrete result.

Claim 26 comprises steps of determining, initiating, and pausing. The steps are just an abstract idea. The claim do not provide practical application that produces a useful, tangible and concrete result. Therefore, the claim is non-statutory. Similar problems exist in the other claims 27 and 28 since the additional limitations claimed therein do not provide practical application that produces a useful, tangible and concrete result.

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***Claim Rejections - 35 USC § 112***

3. Claims 21-25, and 29-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 21, lines 4-5, it is not clear whether the processing of instruction will be paused when said first instruction is not of a first type. Similar problems exist in claim 34, lines 4-5, when said first instruction is not an instruction of said first type, it is not clear whether the counter will be initiated.

In claim 21, lines 7-8, it is not clear what is meant by "responsive to the determining operation" since it is not understandable. Further, it is not clear the resuming step is responsive to what kind of the determination result. The language renders the claim indefinite. Similar problems exist in claim 29, lines 5-6, and claim 34, lines 9-10.

4. Claims 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the relationship between

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the determining step and the pausing step is missing. Similar problems exist in claims 29-33, the relationship between a decode unit to determine and to pause.

Applicant is required to review the claims and correct all language which does not comply with 35 U.S.C. § 112, second paragraph.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 21-25, and 29-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Emer et al. (USA 6,493,741) (Herein referred as Emer et al.).

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Referring to claim 21, Emer et al. discloses, as claimed, comprising the steps of:

determining whether a first instruction (QUIESCE 117, Fig. 2, and Col. 5, lines 34-35) for a first thread is an instruction of a first type (the type having QUIESCE operation) at a pipeline stage of a processor (see Col. 4, lines 15-18 regarding the program instruction propagating into the pipeline);

pausing processing of instructions of said first thread (Col. 5, lines 35-36, and Col. 7, lines 33-36 regarding halting the execution of the thread) at said pipeline stage for a period of time (note the Emer et al.'s system also uses a timer 107, see Fig. 8, Col. 5, lines 63-64, and Col. 6, lines 9-11) if said first instruction is of a first type (the type having QUIESCE operation) while processing instructions from a second thread (see Col. 4, lines 32-34 regarding allowing other executing programs to utilize available resources when the first thread is paused) at said pipeline stage (note the instructions in the second thread can be selectively fetched (by the thread multiplexor 353) and arranged in the pipeline see Fig. 4); and

resuming processing (see Col. 9, lines 17-21 regarding resuming the processing) of instruction of said first thread responsive to the determining operation at said pipeline stage.

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Note claim 21 recites the corresponding the limitations of claim 29, as set forth above. Note Emer et al.'s CPU certainly comprises a decode unit therein; and an instruction is certainly decoded into several microinstructions in the Emer et al.'s system to determine whether a first instruction (QUIESCE 117, Fig. 2, and Col. 5, lines 34-35) of a first thread is an instruction of a first type (the type having QUIESCE operation).

As to claim 22, Emer et al. certainly taught: decoding said first instruction (QUIESCE 117, Fig. 2, Col. 5, lines 34-35) into a first microinstruction and a second microinstruction (since a decode unit certainly exists in the Emer et al.'s CPU; and an instruction is certainly decoded into several microinstructions in the Emer et al.'s system). Note the limitations of claim 22, as set forth above, comprise the claimed limitations described in claim 30.

As to claim 23, Emer et al. explicitly taught: said first microinstruction causes a value (inside the watch flag indication 105, see Col. 5, lines 59-60) to be stored in memory (the register of watch flag indication 105, Fig. 2) for said first thread. Note the limitations of claim 23, as set forth above, comprise the claimed limitations described in claim 31.

Referring to claim 24, Emer et al. explicitly taught: processing said microinstruction for execution when said value



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(watch flag 105) stored in memory is reset (see Col. 7, lines 37-38, regarding when the watch flag is cleared). Note the limitations of claim 24, as set forth above, comprise the claimed limitations described in claim 32.

Referring to claim 25, Emer et al. explicitly taught: said value stored in memory value (watch flag 105) is reset when said first microinstruction is retired. Note "said first microinstruction is retired" is given broadest reasonable interpretation as the QUIESCE instruction (Fig. 2, Col. 5, line 34-35) is terminated by an interrupt as mentioned in Col. 9, lines 18-20. Note claim 33 recites the similar limitations as set forth. The interrupt servicing routine (see Col. 9, lines 18-20) is best reasonably and broadly interpreted as a retire unit as claimed.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

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said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 26-28, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emer et al.

Referring to claims 26-28, Emer et al. discloses the claimed invention except for: initiating a counter; and pausing processing of instructions of said first thread at a pipeline stage of a processor until said counter reaches a predetermined value while processing instructions for a second thread at said pipeline stage; and the first instruction including an operand and the initiating including loading the counter with the operand (in Claims 26-28 and claims 34-36 recite the similar limitations.)

However, Emer et al., as set forth above, using a timer (107, Fig. 2) to pause processing of instructions of said first thread (see Fig. 8, Col. 5, lines 63-64, and Col. 6, lines 9-11).

Further, using a counter to control the time during a process in a computer system; and loading the counter with the operand to flexibly control the length of time are well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Emer et

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al.'s system to comprise initiating a counter; pausing processing of instructions of said first thread at a pipeline stage of a processor until said counter reaches a predetermined value while processing instructions for a second thread at said pipeline stage; and the first instruction including an operand and the initiating including loading the counter with the operand since using the counter is just an alternative way to flexibly control the length of time as comparing with the timer used in the Emer et al.'s system.

***Response to Amendment***

9. Applicant's arguments filed 2/16/06 have been fully considered but they are not deemed to be persuasive.

Regarding the 35 U.S.C. §112, second paragraph problems, Applicant's response has not completely overcome these objections and rejections.

Applicants argue that "Claim 21 recites that a first instruction can result in the pausing of processing of instructions from the first thread at a pipeline stage while processing instructions from a second thread at the pipeline stage of the processor. Claim 26 includes a similar limitation.

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Such a feature is neither taught nor suggested by Emer. In Emer, the entire thread processing unit is quiesced. If such a TPU includes pipeline stages (though none are described in Emer), then none of those pipeline stages would be processing instructions from a second thread as called for in these claims." (page 7, lines 15-21). Examiner disagrees with Applicants. As set forth in the art rejections above, Emer et al. discloses, as claimed, comprising the steps of: pausing processing of instructions of said first thread (Col. 5, lines 35-36, and Col. 7, lines 33-36 regarding halting the execution of the thread) at said pipeline stage for a period of time (note the Emer et al.'s system also uses a timer 107, see Fig. 8, Col. 5, lines 63-64, and Col. 6, lines 9-11) if said first instruction is of a first type while processing instructions from a second thread (see Col. 4, lines 32-34 regarding allowing other executing programs to utilize available resources when the first thread is paused) at said pipeline stage (note the instructions in the second thread can be selectively fetched (by the thread multiplexor 353) and arranged in the pipeline see Fig. 4). As to Claim 26, it includes a similar limitation. However, Claim does not have the limitation: a first instruction can result in the pausing of processing of instructions from the first thread.

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Applicants argue that "Claim 29 refers to a decode unit that is to determine whether a first instruction of a first thread is an instruction a first type and to pause processing of instruction of the first thread. Claim 34 includes a similar limitation. Such a feature is neither taught nor suggested by Emer." (page 7, last three lines). Examiner disagrees with Applicants. As set forth in the art rejections above, claim 21 recites the corresponding the limitations of claim 29, as set forth above. Note Emer et al.'s CPU certainly comprises a decode unit therein; and an instruction is certainly decoded into several microinstructions in the Emer et al.'s system to determine whether a first instruction (QUIESCE 117, Fig. 2, and Col. 5, lines 34-35) of a first thread is an instruction of a first type (the type having QUIESCE operation). Emer et al. does teach the claimed limitations in claims 29 and 34.


#### **Contact Information**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Henry Tsai whose telephone number is (571) 272-4176. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful,

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the examiner supervisor, Fritz M. Fleming, can be reached on (571) 272-4145. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC central telephone number, 571-272-2100.

11. In order to reduce pendency and avoid potential delays, Group 2100 is encouraging FAXing of responses to Office actions directly into the Group at fax number: 571-273-8300. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2100 will be promptly forward to the examiner.



HENRY W. H. TSAI  
PRIMARY EXAMINER

April 28, 2006